

EFO

Electrostatic filters for oilmist



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The PlymoVent EFO filters are the result of the most stringent tests in tough industrial environments. Many years of experience from EFO installations worldwide attest to the advantages of the unique 5-step combination of mechanical and electrostatic filtration.

Why settle for less than peerless performance and maximum return on your investment?

PLYMOVENT[®]
INTELLIGENT PROCESS VENTILATION™

See through the mist!...

PlymoVent electrostatic filters for oilmist

The very best solution to the problems of oilmist and emulsions.

PlymoVent electrostatic oilmist filters, EFO, are specially developed to handle oilmist problems. They work according to the principle of electrostatic precipitation... the best solution for the cleaning of air containing oil particles. And also the most profitable!

Big cost savings on energy

The EFO units are equipped with robust electrostatic cells of the industrial type. They have an extremely long life and require no maintenance. The cells seldom need cleaning as the oil flows straight down into the oil collecting sump. The cleaned air is recirculated into the premises with no heat loss and the collected oil can be re-used. This demonstrates the savings to be made and therefore an increase in profits!

PlymoVent offers you a clean working environment at the right price.

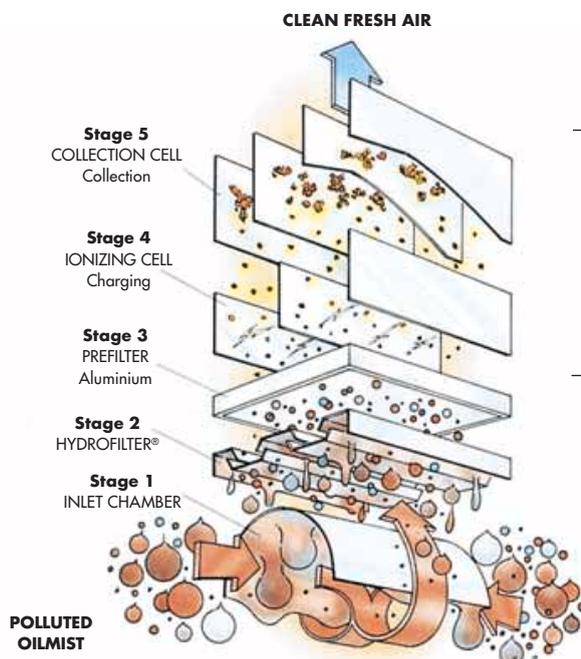


ESSENTIAL FACTS

Insist on the 5-step efficiency of an electrostatic oilmist filter and only PlymoVent EFO meets the standards.

There's more inside this EFO than in other electrostatic oilmist filters. The exclusive 3-step mechanical pre-filtration captures 80% of the oil, optimizing the efficiency of the two electrostatic steps. It also minimizes cleaning of

the electrostatic cells and eliminates the need for replacement. Due to the highly specific EFO design, it is ideal for water-based emulsions, separating particles down to 0.005 µm.



Electrostatic filtration, stage 4-5

In stage 4, the electrostatic filter's ionizing cell, all remaining particles are charged with 12 000 Volts whereafter they are efficiently attracted to the negatively charged collector plates of the collection cell.

Mechanical filtration, stage 1-3

80% of all oilmist particles (i.e. all in liquid form) are captured in the mechanical filter.

Facts about oilmist

- Eyes, skin, breathing and swallowing are all at severe risk from contact with and exposure to oilmist.
- No oil product can be considered "not dangerous" to your health. Even a harmless oil can be dangerous if it is spread by aerosol, which can cause oil-lung.
- One single heavy exposure to oil-mist can cause oil-lung, a type of pneumonia.
- In oilmist there is both oil-aerosol, which consists of particles larger than 1µm and oil-steam, with particles smaller than 1µm.
- According to the Swedish Work Protection Society's findings, electrostatic filters are the only type of filters which effectively separate particles smaller than 2µm (0.002 mm).
- Limit for oilmist is 1 mg/m³ air.

EFO – 2 case studies

1. Waterbased cutting fluid at Maveco in Holland



The installation

Maveco in Holland is a subsupplier of processed steel components to the large machine manufacturing industry as well as a producer of machines for the same sector. Maveco had great difficulties with a high concentration of oilmist in their manufacturing building, resulting in not only a hazardous working environment for the machine operators, but also unnecessarily high maintenance costs of the production site as well as the machinery. PlymoVent was contracted to solve this problem and to eliminate the oil polluted air, arising from the cutting fluid during the manufacturing process.

Design

These specific problems at Maveco were solved by installing an EFO-5000 electrostatic oilmist filter, connected to the covered CNC machines via ducting systems. The EFO filter is dimensioned so that two of four machines operate simultaneously, controlled by a PlymoVent ASE-12 Automatic Damper, and thereby Maveco obtained an energy saving as well as highly cost effective filtration system from PlymoVent.

Filtration system at Maveco

Total filter capacity: 2000 m³/h

Filter: 1 pc EFO-5000

Fan: 1 pc FUA-3000

Control equipment: 4 pcs ASE-12

2. EFO filters oilmist at Sandvik Hard Materials in Denmark

The installation

Sandvik Hard Materials is a large subsupplier of ground parts in hard materials. Some of the products they manufacture are jointing rings and scraping knives. During grinding they use cooling oils which result in problems with oilmist. After testing one EFO-2000 with FUA-1300 over 3 months they were convinced how to solve the problems. Today they have installed a total of 16 EFO filters and have absolutely no problems with the working environment.

Design

Some of the grinding and CNC machines are directly connected to the EFO filters and some of the machines are equipped with a Miniman extractor. All the EFO filters are equipped with direct mounted fans.

Filtration system at Sandvik Hard Materials

Total filter capacity: 14000 m³/h

Filters: 12 pcs EFO-2000, 4 pcs EFO-3000

Fans: 12 pcs FUA-1300, 4 pcs FUA-2100





Electrostatic oilmist filters have two big advantages:

1. They separate particles down to $0.005 \mu\text{m}$ (0.000005 mm) and thus separate a great deal of the oil-steam in the air which otherwise would be an extremely serious health risk to personnel. Centrifugal separation or mechanical filtration seldom collect particles smaller than $1.0 \mu\text{m}$ (0.001 mm).

2. The filter cells do not need to be replaced, they can be washed and reused for many years. To minimize maintenance, PlymoVent's EFOs are designed and constructed so that only the smallest particles reach the electrostatic cells. The larger particles are already separated in the expansion chamber and in

the efficient prefilters. PlymoVent electrostatic oilmist filters can be connected to central duct systems with flexible at-source extraction arms, or to fixed installations direct to machinery, so called "process ventilation". The units can also be free-hanging to circulate the air in the premises and reduce the total concentration of pollution.

TECHNICAL DATA

Prod. no.	Rec fan	Max filter airflow m^3/h	Active filter area m^2	Dimensions incl. fan and inlet			
				Height mm	Width mm	Depth mm	Weight kg
EFO-2000	FUA-1300	1000	9,6	1336	506	540	94
EFO-2002/AL*	FUA-1800	1000	9,6	1336	506	540	95
	FUA-2100	1000	9,6	1341	506	540	98
EFO-3000	FUA-1800	1500	16,4	1414	506	750	118
EFO-3002/AL*	FUA-2100	1500	16,4	1419	506	750	121
	FUA-3000	1500	16,4	1893	506	750	126
EFO-5000	FUA-2100	3000	32,8	1858	506	750	170
EFO-5002/AL*	FUA-3000	3000	32,8	1893	506	750	175
	FUA-4700	3000	32,8	1958	506	750	184

* These models are equipped with a safety-monitoring device, that indicates with light and sound. In case the malfunction remains the filter and fan automatically stops.

PlymoVent has developed a unique combination of mechanical and electrostatic filtration for emulsion and oilmist.

The design includes:

- Three stages of mechanical filtration
- Two stages of electrostatic filtration
- Unique design of the cells which permits us to handle emulsions with up to 95% water.